

A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
FRÖLICH, Sten et al : Docket: ANO 6187 US1
Serial No. 10/066,077 : Examiner: P. Chin
Filed: January 31, 2002 : Group Art Unit: 1731
Title: A PROCESS FOR MANUFACTURING OF PAPER

Assistant Commissioner for Patents
Washington, D.C. 20231

DECLARATION UNDER 37 C.F.R. §1.132

Sir:

I, Erik Lindgren, do hereby declare and say that:

(1) I am a citizen of Sweden residing at Aasbacken 28, SE-44534 Bohus, Sweden. I am a research scientist employed by Eka Chemicals AB, since 1987 and since then I have been involved in the development of paper chemicals and, in particular, sizing, drainage and retention aids.

(2) I am a co-inventor of U.S. Patent Application Serial No. 10/066,077 (the present application) and I am familiar with the field of papermaking.

(3) The following retention, drainage and sizing performance tests have been conducted by me or under my direct supervision:

The retention and dewatering properties of the formed furnishes were evaluated by measuring the dewatering time and turbidity in an equipment similar to a Dynamic Drainage Analyzer (DDA-unit) which has been modified with a moving bottom forming a constant vacuum during the dewatering. A lower value in the dewatering test means a better dewatering efficiency. The retention was evaluated by measuring the turbidity of the white water with a Nephelometer 156 from Novasine. A lower turbidity value corresponds to a better retention of solids. The sizing of the formed dried and cured

sheets was evaluated by measuring the contact angle of water after 10 seconds utilizing a Dynamic Absorption and contact angle tester from Fibro Systems. A higher value means a better sized sheet.

A pulp (at 0.5 g/l) used was a 80/20 mixture of hardwood/softwood kraft. Ground calcium carbonate filler (GCC) was added to the pulp, to a concentration of 40% on dry solids. The resulting furnish was diluted to 0.12% before the additional chemicals were added.

The chemical additions are expressed as % by weight of dry solids of the furnish. In this example the conductivity of the diluted furnish was adjusted 325 mS/cm by addition of sodium sulphate.

A dispersion containing a conventional ketene dimer sizing agent (C222) and 10kg/t cationic starch (Perlbond 970) were added to the furnishes.

Subsequent to these additions, 0.5 kg/t of either a 0.1% of an aromatic cationic polyacrylamide having benzyldimethylammonium groups, or 0.1% of a conventional non-aromatic cationic polyacrylamide was added to the prior to the 0.1% solution of an anionic polystyrenesulphonate (PSS) with a weight average molecular weight of 70,000. The amount added PSS was 0.3 or 0.7 kg/t. The addition sequence was after 2 seconds of mixing addition of ketene dimmer, after 17 seconds starch, after 32 seconds polyacrylamide, after 47 seconds the PSS and at 62 seconds the dewatering started. All times are given after the start time.

The improvement in retention performance (turbidity), dewatering time and sizing efficiency (contact angle) when using a cationic polymer having an aromatic group compared to a cationic polymer not having an aromatic group is shown in table 1.

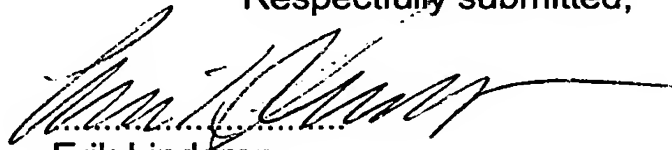
Table 1

Test No.	AKD	C-PAM	PSS	Turbidity	Dewatering time	Contact Angle
	kg/t		kg/t	(NTU)	(s)	
1	0.3	non-aromatic	0.3	50	16.7	82
2	0.3	aromatic	0.3	46	16.5	87
3	0.4	non-aromatic	0.7	58	17.8	94
4	0.4	aromatic	0.7	50	16.6	99

(4) My conclusions of the tests are that the papermaking process using an aromatic containing cationic polymer shows considerably improved drainage, retention and sizing performance over the papermaking process using a non-aromatic containing cationic polymer.

(5) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,



.....
Erik Lindgren

20050923
.....
Date